

c1
--where n_0 is the refractive index for the design wavelength λ_0 of the material of the diffraction grating 3, and varies depending on the associated wavelength, d is the grating thickness, and m is the diffraction order.--

Please amend the paragraph starting at page 16, line 7, and ending at line 12, as follows. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

c2
--where n_{01} and n_{02} (which also vary depending on the particular wavelength) are the refractive indices for the wavelength λ_0 of the materials of the first and second layers 4 and 5, respectively, and d_1 and d_2 are the grating thicknesses of the first and second diffraction gratings (the first and second layers) 4 and 5, respectively.--

IN THE CLAIMS:

Please amend Claims 18 and 19, as follows. A marked-up copy of the claims, showing the changes made thereto, is attached. For the Examiner's convenience, all of the pending claims are provided below.

1. A diffractive optical element, comprising:
a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same.

2. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m integer times the wavelength, and values of m in the two wavelengths are the same, and peak portions and valley portions of said pair of diffractive gratings are formed in a chamfered shape.

3. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other,

wherein a maximum optical path length difference occurring in light passing through said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, and peak portions and valley portions of said pair of diffractive gratings are formed in a chamfered shape.

4. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, and peak portions of said pair of diffractive gratings are formed in a chamfered shape.

5. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, and valley portions of said pair of diffractive gratings are formed in a chamfered shape.

6. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other,

wherein a maximum optical path length difference occurring in light passing through said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, and peak portions of said pair of diffractive gratings are formed in a chamfered shape.

7. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other,

wherein a maximum optical path length difference occurring in light passing through said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, and valley portions of said pair of diffractive gratings are formed in a chamfered shape.

9. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, peak portions of one of

said pair of diffractive gratings are formed in a chamfered shape, and valley portions of the other of said pair of diffractive gratings are formed in a chamfered shape.

10. A diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other,

wherein a maximum optical path length difference occurring in light passing through said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, peak portions of one of said pair of diffractive gratings are formed in a chamfered shape, and valley portions of the other of said pair of diffractive gratings are formed in a chamfered shape.

11. A diffractive optical element for diffracting light of a specific order with a high diffraction efficiency, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same, wherein said integer is the number of said specific order.

12. A blazed type diffractive optical element, comprising:

a diffractive grating portion having a pair of diffractive gratings, said pair of diffractive gratings differing in dispersion from each other, and said pair of diffractive gratings confronting each other through a space of a refractive index of 1,

wherein a maximum optical path length difference occurring in light passing through said pair of diffractive gratings with respect to each of at least two wavelengths is m (integer) times the wavelength, and values of m in the two wavelengths are the same.

13. An optical system, comprising:

a diffractive optical element according to one of claims 1 to 7 and 9 to 12;

and

a lens systems.

14. An optical system according to claim 13, wherein each of said at least two wavelengths are within a visible range.

15. An optical system according to claim 13, wherein one of said pair of diffraction gratings is made of resin.

16. An optical system according to claim 13, wherein each of said pair of diffraction gratings are made of resin.